In the frequency range 33 GHz to 325 GHz, spurious frequencies are measured as power densities. For further remarks see section 1.). In order to simplify spurious measurements, the FMCW-modulation is disabled, and the EUT is operating as a CW transmitter. The RBW and VBW are set to such a value that spurious power levels clearly are readable above fundamental noise level.

4. Measurements of maximum safe level for radiated power density

According to FCC § 1.1307, 1.1310, 2.1091, and 2.1093 and also according to ETSI/EN 301 091 measurements are carried out in order to evaluate the impact of human exposure to RF radiation. For this test the EUT is in normal operation mode: FMCW and normal pulse mode. The measurement is performed at 5 different distances: 4 m, 2 m, 1 m, 0.5 m, and 0.25 m. See ETSI test report 2-3314-01-02/03 page 15.

The measurements are applicable only for far field conditions. The near field area extends to a distance of R (meters) and can be calculated from the following equation:

$$R < 2 * L^2 / \lambda$$

with R = distance in meters, L = largest dimension of either receiving or transmitting horn antenna (L = 0.02 m), and λ = wavelength in meters. In case of 76 GHz (λ = 0.0039 m), the far field starts at R > 0.205 m.

The peak power density is measured in 3 m distance as 7.5 µW/cm^2 (-21.25 dBmW/cm^2).

Peak Power (EIRP) $EIRP = PD * 4\pi * R^2$
                             EIRP = 8.482 W (Peak)

This is a PEP value which must be multiplied with the duty cycle correction factor (dcc) in order to get the average value. With t on = 9.412 ms, and t off = 90 ms.

                             dcc = 20 * log (t on / t off)
                             dcc = -19.61 dB
Average power (EIRP)   eirp = 10 log (EIRP Peak) - dcc
                             eirp = -10.32 dBW
                             EIRP = 92.789 mW

Limit of maximum ERP for frequencies above 1.5 GHz is 3 W. See FCC § 2.1091

RF Exposure for mobile conditions at R = 20 cm distance from EUT

                             PD   = EIRP average / (4\pi * R^2)
                             PD   = 0.0184 mW/cm²

Limit of maximum permissible exposure (MPE) for uncontrolled environment:1.0 mW/cm². See FCC § 1.1310.